Hobbies WEEKLY

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A WORKING MODEL STEAM ROLLER

HERE is another interesting little working model for our nimble-fingered craftsmen. A tiny steam roller with working flywheel, and a front roller that can be steered by hand to turn in any direction. This should certainly please the youngsters, and the fretworkers too.

As we have been able to give a whole page in this issue (on cover iv) to the parts which go to make up the model, the work will be greatly simplified inasmuch as no drawing out or enlarging is required, and the work can be started straight away from the detail given.

Size and Materials

The completed model thus made is only 5ins. long and 2¾ins. high, but those wanting a larger one should be able to enlarge the drawings by one of the methods previously described in these pages.

Wood 3/16in. thick is used throughout, except, of course, for such items as the boiler and the front roller which are made from round rod.

We can commence work with the boiler, which is made from a piece of ⅞in. diameter rod 2½ins. long. It is undercut as the side view shows.

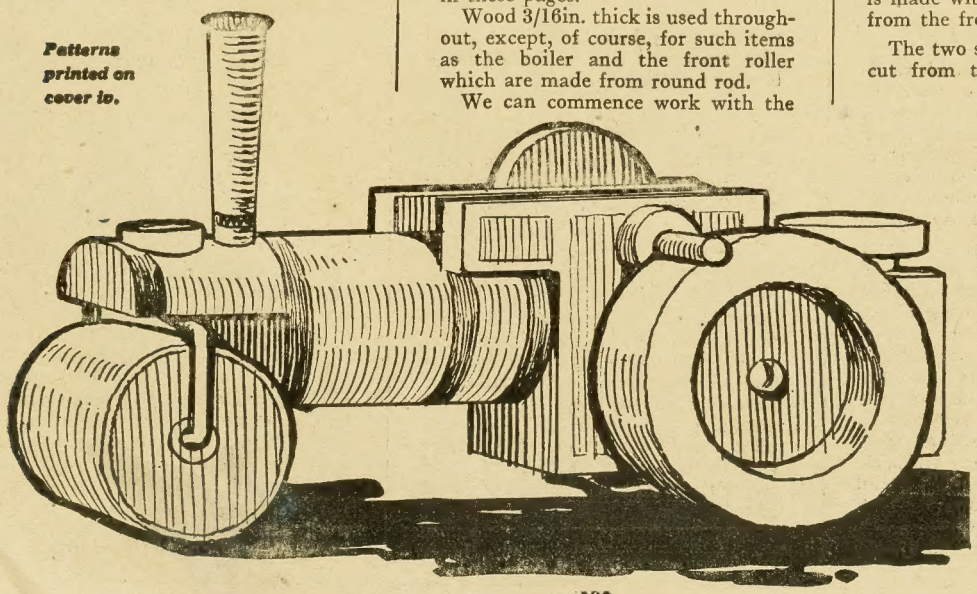
This view of the model is also most useful as it gives the position of all the parts and the assembly is therefore, much simplified. In Fig. 1, of the details of the model, the cutting of the rod for the boiler is made clear. It will be seen from the side view that a hole must be made up through the front projecting part to take the frame of the front roller. The hole is made with the centre 5/16in. back from the front edge.

The two sides of the body are next cut from the patterns given. The front B is next cut and this is glued and screwed to the end of the boiler in the position shown by the dotted lines. Glue the two sides A to this front and then cut the two floor pieces C and glue them between the sides. Fill the back of the body part with piece D.

The general method of assembling the various pieces is shown at Fig. 2. The two side blocks E are cut next and glued to the sides in the position shown on the front view of the model.

The hole in these blocks for screws whichform the axles for the the large rollers should be noted.

Patterns printed on cover iv.



The screws are clearly seen in the side view of the model. Also in these two blocks must be made shallow grooves, as shown in the section of the pieces on the patterns.

It will be seen in Fig. 2 that the steering cords go through these grooves before they pass into the holes in the sides of the body and thence to the steering column inside. This arrangement is seen in Fig. 2.

The large rollers are simple to make. Each consists of two pieces of the 3/16in. wood glued together. On the patterns the piece marked ' 'wheel F " forms the inside disc of the wheel, and the rims G are simply glued on to get the proportionate width of the rollers.

Roundhead screws either ½in or ⅝in. long will be found suitable as axles, and it must be remembered that sufficient clearance should be allowed for the wheels to revolve freely but not loosely round the screws. It would assist the smooth-running of the rollers if a thin metal or ivorine washer be placed between the rollers and the sides of the body.

The steering gear should be made next. It consists of discs G and H glued together, and the steering rod J cut to the length shown and glued into them. Rod J passes freely down through the holes in the two floors C, and later on, after the front roller is made and fixed, the steering cord will be looped round it several times to get a grip. Thus when the engine is pushed forward by fingers of the left hand the front roller is turned and controlled by the right hand turning the discs.

Fitting the Flywheel

The flywheel and its spindle are made up as Fig. 3 shows. The flywheel is cut from 3/16in. wood and rubbed down on glasspaper to rather more than ⅛in. thick so it clears the side of the body and the large roller when it revolves.

The flywheel axle is shown as K, and after it is glued in the flywheel (see the dotted line) it is run through the slotted holes in the sides of the body and there held in place by a smaller washer.

It will be seen that the axle will rest upon the large roller each side and will thus revolve directly the engine is put in motion.

The front roller may, by the way, be made from a cotton reel or bobbin instead of the round rod first suggested If the reel is used, the hole in the centre must be first plugged—filled up with a piece of round rod glued in. When this is done, a hole must be bored through the centre large enough to take the wire which is to make the roller frame shown on the pattern page

In making this frame, first push a length of wire 5ins. long through the roller to half its length, then bend up the sides and file a very shallow nick about 1½ins. down from the top. It will then bend easily to form the square-topped frame shown in the detail

The top free ends of the wire are now bound tightly with fine wire, or if the worker is expert enough the two wires may be soldered together at this place. It only remains now to push the " stem " up through the hole in the front of the boiler and finish off at the top with a wood disc L which must be rubbed down to fit the curvature at that part.

The funnel can be made from a piece of soft wood and shaped up to the profile and sections shown on the sheet.

Painting the Funnel

The model should be painted or enamelled in appropriate colours. The boiler being green with yellow bands to represent brass. The sides of the body might be grey, and the flywheel and inner parts of the large rollers black with buff edging.

The tread of the rollers should be pale grey and the ends of the front roller and the funnel black. The flywheel axle and the steering discs should be red.

It may be remarked, by the way, that the flywheel of a steam roller is always placed on the left of the driver, but in our model we have it on the right hand. This is to give more working space to the left hand which is pushing the model along.

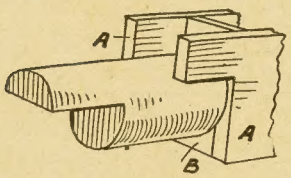


Fig. 1.—Boiler and forepart

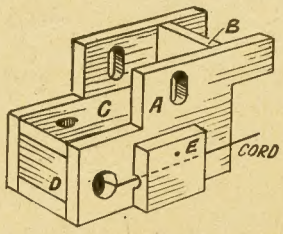


Fig. 2.—The Bodywork

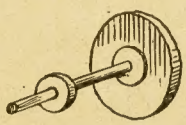


Fig. 3.—Flywheel parts

REPLIES OF INTEREST!

Workshos Treadle Unit

I HAVE just completed a little workshop in which I intend to do various odd jobs, mostly woodwork articles. Would you advise me re installing a treadle-operated machine incorporating (at moderate cost) a few useful units such as grinder, wire and felt wheels, small saw bench, etc. ? (J.S.—Welwyn).

TO be of really practical use for gneral woodwork, you require a treadle and driving wheel weighing about 1 cwt. and measuring about 24ins. diam. These can sometimes be had secondhand, but are not obtainable at present except for essential war work under a Government contract. A circular saw about 12ins. diam. is very useful, a small grinding wheel about 6ins. diam. and ¾in. wide of medium hardness and grit is useful for tool grinding, if run at a high speed (say 1,200 to 2,000 r.p.m.) A drill chuck fixed to one end of the circular saw spindle, to take drills or bits, makes a useful substitute for a borng or drilling machine.

Making Arrows

PLEASE tell me how to make arrows (kind of wood, etc.) for a 5' 9 bow. (K.W.—Macclesfield).

ARROW shafts should be made of well-seasoned red deal, with a hard wood " pile " footed and spliced to the shaft and to this the metal point or pile is attached. The nock or " notch " is cut square across the shaft. There should be three feathers and the body feathers of a turkey or peacock being the best. They should be about 1½ins. long, ¼in. wide, and all curve the same way. The arrows should be about 25 to 27ins. long and weigh the same as the weight of 4/6 of silver coins. Upkeep of the bow is simple, " unstring " it when not in use and suspend it from one end, keep it in a cool place and occasionally rub the wood with a cloth dampened with linseed oil.

Lighting Apparatus

THE only light in my small workshop is one 6-volt bulb run off a car battery; as I only have this one battery plus a 6-volt car dynamo plus a treadle lathe, is it possible to connect all these and so keep my battery charged as I do quite a lot of treadling during the daytime. (R.D.—Porthill).

YOU could readily drive your dynamo while treadling your lathe, but it would, of course, take more effort to do this than just to do the turning. All you require is a belt drive from the largest diameter of the treadle wheel, to a small pulley on the dynamo spindle. Connect the output terminals of the dynamo, via a double pole change-over switch to the battery. When charging, set the switch in one position, and except during momentary stops, set in opposite position when not treadling.

The radio enthusiast will be interested in these notes

ABOUT MICROPHONES

THE modern microphone owes its existence to the early experiments of Alexander Graham Bell. Like many other ingenious inventions, the microphone—or rather, its crude equivalent—was discovered purely by accident.

It all happened one afternoon in June, 1875, in a small workshop in Boston, U.S.A. Bell and his assistant Thomas A. Watson, were at work in separate rooms testing a new form of musical telegraph, this being a device by which its inventor was able to transmit about twelve "musical" signals simultaneously over a single wire, the signals being produced by means of a series of tuning forks varying in pitch.

A Lucky Break

While the testing was in progress, Watson began to have difficulty with a spring in his part of the apparatus. The spring, instead of vibrating freely, persisted in adhering to the pole of its magnet. So, plucking at the spring to make it free itself, Watson was startled as Bell came running into the room, greatly excited.

"What—what did you do just now?" he panted. "No—don't touch anything let me see!" It then transpired that the plucking of the spring, faintly reproduced, had been heard by Bell in his room. The spring, vibrating over the pole of its magnet, had generated a sympathetic electric current and thus transmitted the actual sound in its true audible form.

It became obvious to Bell that if such a sound could be transmitted, it was logical that an instrument based on the same principles could be devised that would transmit all audible sounds, speech—a telephone! And so, Bell immediately stopped work on his musical telegraph and concentrated on his telephone idea.

First Success

On March, 1876, success crowned his efforts, for in that year he spoke the first words ever uttered by man over a length of wire! That, indeed, was a great achievement but it was not until the inventor had managed to overcome great financial difficulties that the telephone was developed commercially. Bell's telephone apparatus was first exhibited in Great Britain by Sir William Thompson, during a meeting of the British Association at Glasgow, in September, 1876.

One of Bell's early telephone transmitters is detailed at Fig. 1. These transmitters, incidentally, could also be employed as receivers. Reproduction, though good, was only satisfactory over short distances, however.

An Early Type

The magnet coils of two of the transmitters were connected in series with a battery in the series. The current flowed along one wire from the battery, went around each coil, then back to the battery via the other wire. By talking into the open end of the horn, the sound waves thus set up caused the "ear drum" of the horn, i.e., the diaphragm, to vibrate in sympathy.

The diaphragm used by Bell was a piece of gold-beater's skin. To the centre of this a short iron armature was pivoted so that, when the diaphragm moved in and out slightly, the armature moved accordingly, and by this means Bell managed to

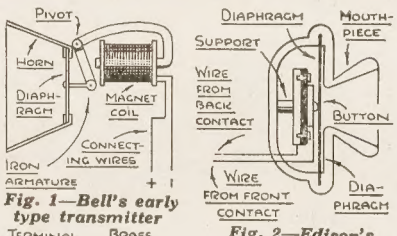


Fig. 1—Bell's early type transmitter

Fig. 2—Edison's carbon transmitter

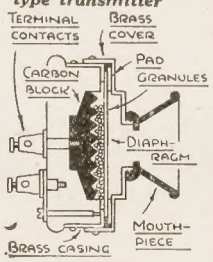


Fig. 3—Hunning's use of carbon granules

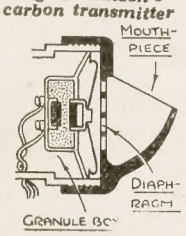


Fig. 4—Transmitter in modern telephone

convert sound into mechanical movement.

As you know, when an electric current travels around a core of iron, the iron becomes magnetized. Thus, there was a strong magnetic field between the core of the magnet and the armature. The diaphragm, vibrating, moved the armature, the latter thereby inducing suitable fluctuating currents in the coil. The variation of current travelled to the second transmitter, causing its armature to vibrate accordingly, the diaphragm reproducing the original sounds made by the speaker as soon, in fact, as the sound were made.

It was, as we know now, a crude arrangement, apart from the crudeness of the transmitters. There have been improvements in transmitters and receivers since Bell's early ideas and conception of them. His transmitters were rather weak and insensitive. One had to shout loudly into the horn (used to amplify the sounds) so that only short-distance transmission was practical—and long-distance transmission was wanted.

Edison's Carbon Microphone

However, A. G. Bell, the pioneer, had been able to demonstrate the possibilities of telephonic-communication to an amazed, sceptical world. Other inventors became interested and, at last, the defect of weakness in transmission was overcome by the invention of the carbon microphone transmitter, a sectional view of which appears at Fig. 2.

The carbon transmitter, devised by Thomas A. Edison, was a simple device, yet ingenious. It was less elaborate in working principle than the Bell transmitter and not so

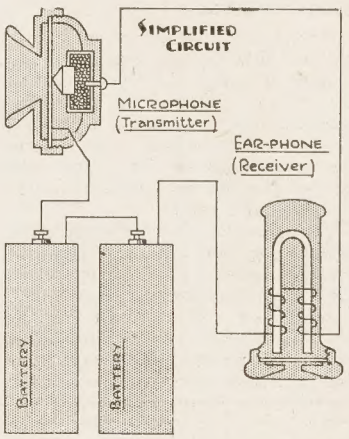


Fig. 5—The basic principles of the telephone circuit are unchanged

primitive. It was more sensitive to sound and thus a more practical transmitting device.

As you can see, Edison arranged a button of soft carbon behind the diaphragm in its centre. The button pressed against a front contact to which one wire was connected. Another wire was fixed to a back contact and between both contacts a thin piece of compressed carbon was fixed.

As the current from a battery passed fron one contact to its neighbour, the movements of the front contact (caused by the sound vibrations of the diaphragm) caused the resistance of that part of the circuit to fluctuate, due to the useful feature of carbon in that its conductivity to electricity varies with the pressure to which it is subjected.

Although an ingenious transmitter, however, the carbon microphone

served mainly as a more satisfactory means of converting sound waves into suitable variations of current. As yet, the microphone—as we know it to-day—was still very much in its infancy.

Use of Carbon Granules

A microphone invented by a man called D. E. Hughes— a development of the Edison transmitter in which two pieces of hard carbon were used, one touching lightly against the other indirectly paved fthe way for super-sensitive telephone transmitters, for the microphonic principle of Hughes' invention became embodied in a telephone transmitter devised by a Yorkshire clergyman, the Rev. H. Hunnings, a sectional view being provided at Fig. 3.

Hunnings thought of using carbon granules instead of solid pieces of carbon. These particles were placed between the diaphragm and a grooved block of carbon. Connection between the diaphragm and carbon block was made by means of terminals; the granules, therefore, filled the "gap" in the current.

Vibration Effects

Consequently, when one spoke into the mouthpiece, the diaphragm vibrated, causing the loose carbon granules to "shake" in a similiar manner, thereby causing a varying pressure on the block. The greater the sound waves, the harder the carbon granules pressed against the block and vice versa.

The granules, when pressed more tightly together against the carbon block, provided a path through which the electric current could more readily flow. The current became less active when the granules were less loosely packed, all of which gave rise to a fluctuating flow of current that varied in accordance with all audible sounds picked up by the diaphragm.

Because of the large number of contact points in Hunnings' microphone transmitter, it was extremely sensitive and, in an improved form, as you can see by the sectional view of a modern dial-telephone transmitter at Fig. 4—it remains unchanged in principle, being much the same as it was in 1876.

Simple Telephone Circuit

For your interest, we print a simplified one-way telephone circuit at Fig. 5. The ear-phone, or receiver, you will observe, is akin in working principle to Bell's early transmitter, consisting, as it does, of an electro-magnet, which affects the "ear-drums" or diaphragm of this metal.

We do not, in the circuit plan, show the present fittings. The basic working principle remains the same—unchallenged, a tribute to the genius of its inventor, Alexander Graham Bell.

Bell, however, owed much to the experiments of Michael Faraday, the man who discovered—or rather, improved upon the discovery of the electro-magnet. Without the knowledge of such a device, he—like many other inventors—would have been at a great loss.

Moving Coil Speakers

The modern moving-coil loud-speaker is a far cry from Bell's primitive receiver. In spite of the number of improvements in the construction of transmitters and receivers, whatever the type, we have much to be thankful for in respect to the men largely responsible for our present electrical apparatus and devices, such as dial-telephones, telegraph machines, electric motors, dynamos, radio, talking pictures and television, etc.

The Modern Microphone

Thus, as we are concerned chiefly with microphones in this article, you will now understand just how the modern microphone came into being. The modern mike is the result of years of planning, research and study —and experimenting.

No longer is it necessary to shout loudly to vibrate the diaphragm in order to make it transmit sounds. A whisper, the merest intake of breath, in fact, can be clearly heard. Why? Because of the use of good quality carbon granules and a small amplifier in the form of an electro-magnet, but instead of a single winding of wire, there are two separate windings called the primary and secondary.

The windings have a ratio of about 100 to 1. The coils of wire, by their respective number of turns on the iron core, increase the electric current flowing through them—transforms the current by increasing it, or to use electrical parlance, steps it up. Without the transformer, the modern mike is useless for practical home-broadcasting purposes, but is ideal for telephonic-communication in the home.

Home Broadcasting

Therefore, by fitting a modern telephone transmitter in series with a microphone transformer and a battery, the transmitter will serve as a home-broadcasting microphone. Table microphones, or suspended models, are built much in the same way as telephone transmitters, excepting that a suitable kind of transformer is wired to them, the transformer being housed, or secreted in the base of the microphone stands.

A Realistic London Bus Model

THE photograph reproduced here was sent us by an ardent reader whose work has been previously mentioned in these pages. He is Mr. W. J. Cooke of Shepherd's Bush, London, who has now been discharged from the army after a period with the services, and is thus able to resume his enthusiastic endeavours.

The model shown, he tells us, was designed by himself from the London type of bus and actually was made from a tea chest and a small packing case, because suitable fancy timber is now difficult to obtain. (We imagined that a tea chest was even more difficult !).

This craftsman not only worked out his own design, but also printed and painted his advertisements on the bus, as well as the destination boards, registration name, number plates, etc.

It is not everybody who is capable of doing such complete work, and Mr. Cooke is to be congratulated on his all-round ability.

Designs are provided for you to cut out statuette

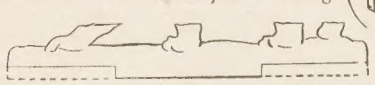
ANIMALS AND ALPHABETS

A VERY large number of our readers have taken the opportunity of making cut-out animal figures, with or without an alphabet, from the complete range of patterns provided in the Hobbies Animal Wallet. There are, however, several methods of making this pleasing set of cut-outs, which may be worth mentioning. As shown, the designs provide for animals, whose initial letters go right through the alphabet. The figures are between 5ins. and 8ins. long, and are cut to stand upright in a base to be fixed there by means of a tenon. The flat base also provides for a letter to stand in it, this letter being the first one of the animal concerned. There is A for Antelope, B for Bear, etc., running right through to Z.

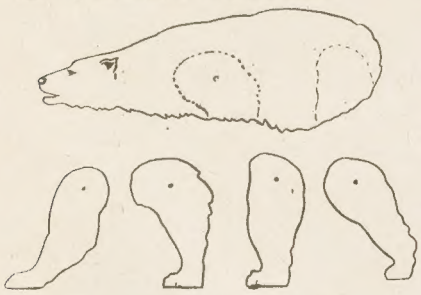
Tenoned Base

There can be various combinations and methods of using these designs. Everyone may not want to incorporate the letter with the animal. Some may want the letters only without the animals, some may prefer to do away with the flat base and incorporate some other method of making the figure stand.

Let us have a look at the way in which this can be done, and taking



Cutting the animal to stand alone



Cut parts for a jointed animal

the "B for Bear" as an example. The base shown is 1½in. wide and 6¾ins. long. It is provided with two slots, one for the bear and one for the letter. You can cut the bear away from the letter, but in that case you will have to shorten the base so it is 4¾ins. long. That end can be rounded like the other, and painted black to make the upright figure stand out more.

On the other hand the base can be cut from thicker wood than ¼in. to make it sufficiently heavy to prevent the likelihood of the animal toppling over.

Other Ways

Another method can be employed to have the animal standing without the flat base. This is to glue a strip of, say, ¼in. square wood along the back in line with the bottom edge. In this case, the tenon will not be cut, but the bottom line of it on the pattern must be continued the whole length of the animal as shown in the diagram herewith. This will provide sufficient depth below the animal's foot to allow the strip to be glued behind unseen.

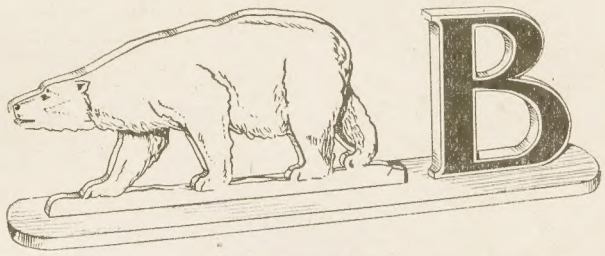
Again, if you want the animals to be jointed, this can be done also. In that case, however, it will be essential to draw the animal on the wood because the legs and thighs will have to be cut as separate pieces. In such cases, the body of the animal is cut to its complete outline, and the legs as separate parts. These must be continued upwards to incorporate the thigh, and rounded at the top as shown herewith.

Remember that two of the legs are to be screwed to the front of the body, and the other two to the back, and the point of their pivot is shown herewith. So far as the letters are concerned, you can make a complete set of alphabet blocks with them merely by cutting round the letters and cutting off the projecting tenon at the bottom.

As Letter Blocks

If you are using these as play blocks for children, then it is advisable to cut them in fairly thick wood—say, ½in. or ⅝in. Cut carefully to the outer line, taking the inside openings away first. In such cases you can, of course, clean off the paper pattern and paint the whole letter block some bright colours. The whole letters can be painted in one colour, say, red, or you may like to vary them, using other colours for other letters.

If you are using the designs exactly as they are printed, the paper, of course, is left on the wood. This shows on one side only, so it is advisable to use paint or ink on the other side to make it alike. Do not forget in this case that the position of the legs will be reversed. Be sure, too,



Showing the completed animal and letter according to the designs provided

to get a fairly tight fit with the tenon.

Before fixing the tenon into the base slot, however, it is as well to cut away the paper on its face, otherwise this will get pushed up and leave an unsightly edge. Lay a ruler along in line with the top of the tenon, run a sharp knife along its edge, and carefully strip off the paper.

If, by the way, you have to glasspaper the tenon down to make it fit the slot, remember to keep the paper flat on a block. In glass-papering this tenon, one is very apt to thin the edge down more than the rest, and in consequence, make a joint which is not an accurate fit. By carefully glasspapering—on the back, of course—with the flat surface, you reduce the tenon equally all over and a satisfactory joint is made.

Helpful Points

These various methods of using this popular set of designs will undoubtedly appeal to many, particularly if the odd pieces of wood you have are not large enough to take all the patterns, but, say, only the figures or the letters. They are just the sort of thing to undertake as a spare-time job, because you can complete each one reasonably quickly without feeling you have a terribly long piece of work on hand.

It is best, by the way, to have the grain of the wood running upwards in cutting the animals.

Free design sheets are given now every other week.

A Floral Photo Frame will be with our next issue

How to introduce simple carving in making
A NOTE-PAD HOLDER

HERE is an interesting little piece of work for those who would like to try their hand at simple carving. It is an attractive case for a note pad, an admittedly useful article to have somewhere handy in bureau or on sideboard for making household notes and reminders

A few odd pieces of fancy wood go to make the case, well any wood such as satin-walnut or oak. The case consists of a flat base piece cut to the dimensions shown in Fig. 1 with

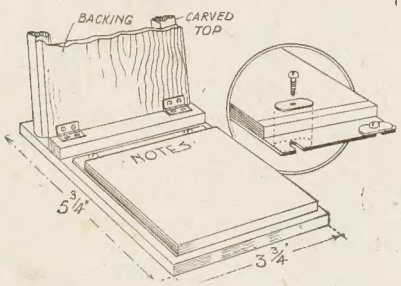


Fig. 1—Details of construction

a cross rail glued to it to take the hinges of the top.

This cross rail, on account of its depth, allows the note pad to rest flat on the base and be covered with the carved top. The arrangement of the parts is clearly understood by a glance at the diagrams in Fig. 1.

Cut the base from ¼in. or 3/16in. wood and see the angles are square. At a distance of ⅜in. from the top end of the base, glue on a ½in. by ¼in. rail 3¾ins. long, and nicely smoothed up with fine glasspaper.

Pencil Holders

At the rear of this rail glue on to the base two pen or pencil rests cut to some such simple outline as suggested in Fig. 2. They may be ¼in. or 3/16in. thick. In addition to the glue fixing, run in a couple of screws through the base into the rests.

The top or lid, as it were, of the case is made up of two thicknesses of wood, one plain piece simply cut to outline (the backing) and the upper piece which forms the carved top.

In Fig. 3 we show the top carved piece actually as it will appear when finished, and also the outline of the design with cross lines forming ½in. squares to facilitate the enlarging process in drawing out the subject full size.

As the Owl design is really an ordinary fretwork design, it may be prepared as such by drawing the squares on a sheet of paper and following each to get the true outline of the piece and the circle with the bird enclosed. It will be clearly seen from the design that there is only one internal opening, and that is round the outline of the bird. Cut this therefore, before cutting round the outside of the square.

Next cut a piece of wood as a backing to that just cut—a piece ⅛in. thick will do. A good plan would be to cut the two thicknesses together so a perfect outline results. All that is necessary to do for this is to pin the two thicknesses of wood together say, with four or six fret pins.

Then draw the outline of the lid on the top piece as a guide for the cutting. The edges can afterwards be slightly rounded off and cleaned up with glasspaper.

The Carved Part

In working up the carved panel first pare off the sharp edges of the outline of the bird. This can be done with a sharp pocket knife finishing up with glasspaper. Cut down a crater-like hollow where the eye is, and smooth round with glasspaper. Add a few radial lines by making vee cuts with the knife.

The feathers of the wing and tail are cut in with the vee-shape fashion and then smoothed off so no hard lines or edges are left. The tail feathers are recessed slightly below those of the wing to make the latter stand above the wing. The foot and the claws are rounded and should stand up prominently.

If a yellow and black glass bead can be obtained this should be set in the recess of the eye to add to the effect.

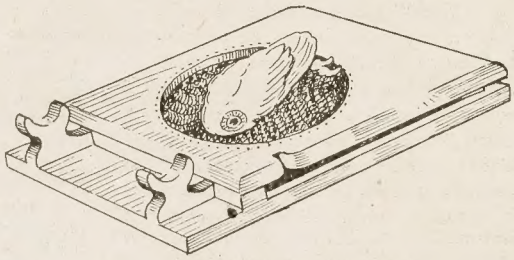


Fig. 2—Picture of completed article

The whole panel should finally be laid on a solid and flat surface and the background round the bird indented with a matting tool. Brass fret pins ¼in. long driven in round or near the edge of the circle will give a little colour relief to the finished panel.

Making the Pad

It only remains now to make the note pad. If a pad of approximate proportions to the base can be obtained then this could be stuck down direct to the top of the base. Or preferably the pad could be glued to a piece of card having two slots made in its top edge, as seen in the circled diagram in Fig. 1.

To hold the card firmly down to the base two shaped pieces of metal or ivorine could be cut to the simple outline shown, and held down through the slots in the card by two round-head screws. Renewals of paper can thus be easily made by lossening the screws and pulling the card forward.

The carved lid of the case is held by a pair of ¾in. brass hinges.

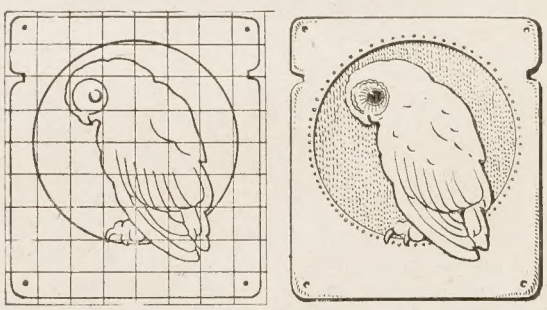


Fig. 3—How to mark and carve the bird feature

WILL readers please remember that most of the designs shown in the Hobbies Handbook prior to the 1944 edition are now unobtainable. This is largely due to lack of material, and even those shown in the current one are not always in stock. Always give an alternative if you can when ordering.

THERE are very few things nowadays which we can get just for the asking, and we are all quite used to the shopkeepers reply "I am expecting some in"—which may mean next week or next month. Much of this, of course, is due to the shortage of the raw materials from which the articles are made, and much from the shortage of staff and assistants which, in turn, causes delay and sometimes inconvenience. This is equally the case, I am told, in the Mail Order Dept. of Hobbies Ltd. at Dereham. Literally thousands of orders are received each day and each has to be carefully checked, sorted, and sifted.

A Practical Mudguard Hint

BICYCLE mudguards, after a time in use, rust away at the inside and, due to rough riding and jarring, soon show signs of breaking up. The breakages, when they occur are always at certain weak points.

Taking the rear mudguard as an example, we show the usual breaking position. It is where a small fixing plate (lug) is secured to the top of the mudguard by means of a couple of rivets. The lug, of course, when fitting the mudguard to the bike frame, is the part which is bolted to the fork cross-piece.

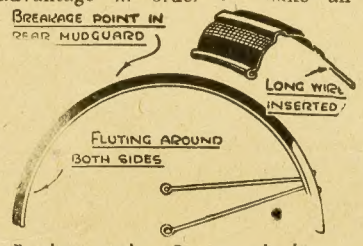
The Point of Fracture

Now, when the wire supports work loose, the whole weight of the mudguard is supported solely by the lug. This means that the mudguard is bending up and down with every bump on the road, apart from getting knocks. Gradually the rivets work loose, the holes enlarge, become rusty and weak and finally the metal cracks across the two rivet holes.

The same thing happens with the front mudguard. Another weak point is where the wire supports are "capped" to the metal. Fortunately most mudguards are made to have a smooth edge at both sides, this being assured by having the metal bent into a fluting all round.

Fluting

This fluting can be utilized to advantage in order to make an effective repair. One merely inserts suitable short lengths of wire (2in. long wire nails, with the heads nipped off) into the holes formed by the fluting, doing so with one broken part of the mudguard.



The other half is joined by merely pushing its flutings against the projecting ends of the wires. Thus, the halves are put together much in the same way that toy train lines are fitted.

The use of beheaded wire nails is, perhaps, the best thing to use, for the beheaded ends can be hammered into the fluting so the points are projecting, the points facilitating the fitting on of the second half of the mudguard.

Lug fixing

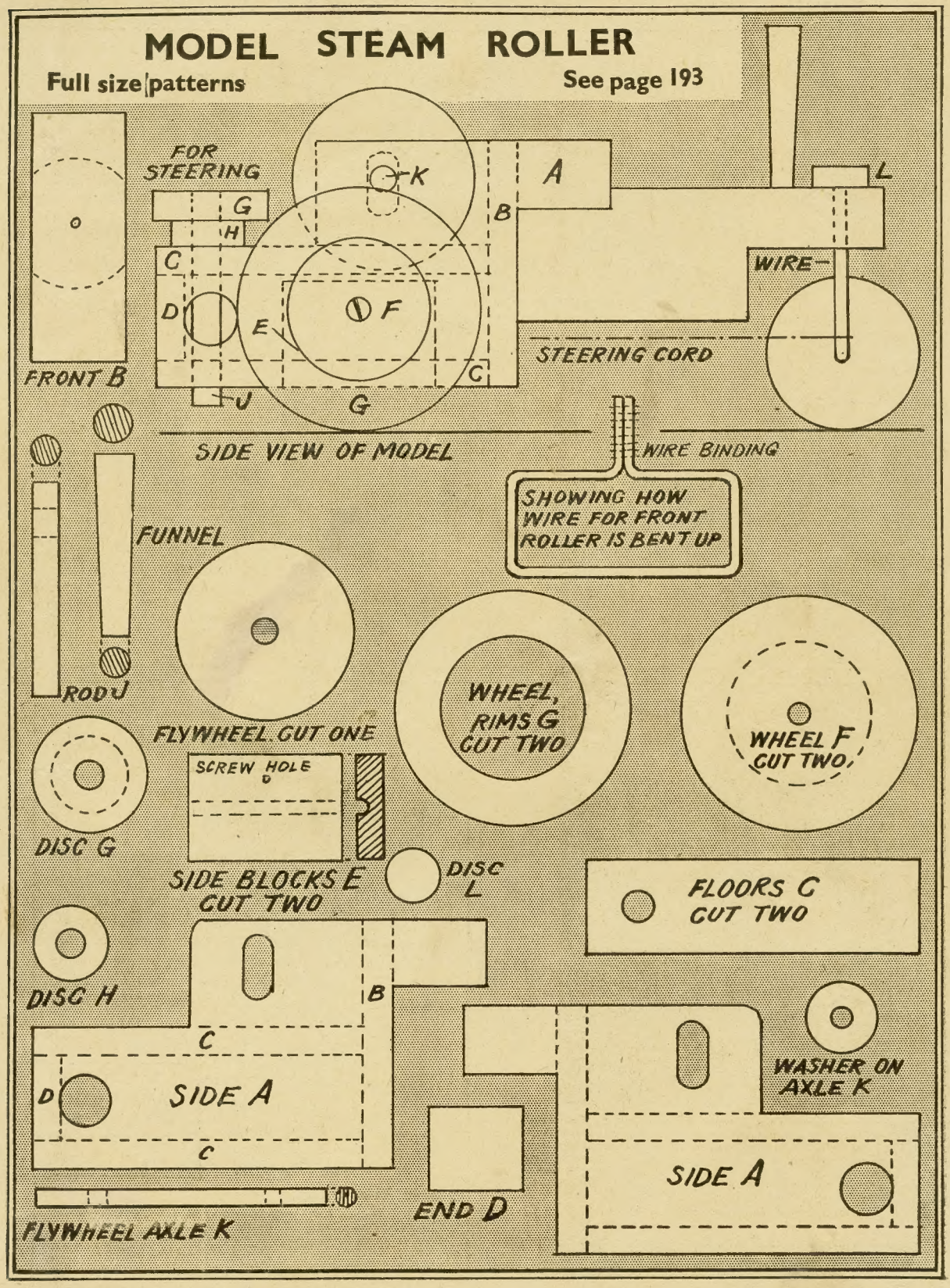
The lug can be fixed on again with new rivets, or small bolts. The bolt nuts should screw down on thin metal washers, these preventing them from breaking the weak, rusty, rims of the rivet holes. The writer has tried out this tip and found it most practical and worth knowing.

A mudguard, repaired as suggested, will give many more years of wear and usefulness. It saves paying a fancy price for a new mudguard which, as often as not, is not on the same par as the old one removed, so far, at least, as the shape and design is concerned. Quite frequently, the fitting is different. You will want to avoid any trouble by trying to repair the old, broken mudguards, and the method outlined is about the most practical one could devise.

MODEL STEAM ROLLER

Full size patterns

See page 193



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